

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 8 (Canceled)

9. (Previously presented) A peptide, consisting of the sequence $S_1 - S_2 - \text{D-Phe(4-Cl)} - S_4 - S_5$, wherein

S_1 is heptanoyl, 2'-naphthylacetyl, 7'-amino-heptanoyl, 2'-chlorophenylacetyl, 3'-

chlorophenylacetyl, 4'-chlorophenylacetyl, 4'-phenylbutylaminocarbonyl, 3'-

phenylbutylaminocarbonyl, 4'-bromophenyl-acetyl, 3,4-dichlorophenyl-acetyl, 2,4-

dichlorophenyl-acetyl, 4-biphenyl-acetyl, 2-naphthoyl, $\text{Ph}-(\text{CH}_2)_2\text{NH}$, 3'-

phenylpropanecarbonyl, 2'-naphthoyl-Pip, 2'-naphthylacetyl, 2'-bromophenyl-acetyl, 4'-

CF_3 phenyl-acetyl, 3'- CF_3 phenyl-acetyl, 2'- CF_3 phenyl-acetyl, 3',5'- CF_3 phenylacetyl, 2',5'-

CF_3 phenylacetyl, 4'-Mephenyl-acetyl, 3'-Mephenyl-acetyl, 2'-Mephenyl-acetyl, 7'-

aminoheptonoyl, beta-Ala, 4-aminoButyl, 5-aminoValeryl, 6-aminoCaproyl,

aminoTranexamyl, Cmpi or 3',4'- Cl_2 phenylacetyl;

S_2 is absent or is Ser(Bzl), Ala, D-Ala, beta-Ala, Val, Leu, Chg, Aib, Tle, 1-amino-

1cyclohexanecarbonyl, Inp, $\text{CO}(\text{CH}_2)_2\text{NH}$, $\text{CO}(\text{CH}_2)_2\text{CO}$, Pip, MeThr(Bzl), Thr(Bzl) or D-

Thr(Bzl);

S_4 is Arg, D-Arg, (Nlys)Gly, Trp, Lys, homoLys, Dpr(beta-Ala), alpha-(N-amidino-4'-piperidine)Gly,

(4'-guanidino)Gly, (4'-guanidino)Phe, D-(4'-guanidino)Phe, beta-(N-amidino-4'-

piperidine)Ala or homo-Ala-4'-pip(N-amidino); and

S_5 is Trp, Trp-OH, Trp-NH₂, D-Trp, D-Trp-NH₂, Trp-Val-NH₂, 3'-Pya-NH₂, Phe-NH₂, MeTrp-NH₂,

beta-Ala-Trp-NH₂, aminobutylamide, Nal 1-NH₂, D-Nal 1-NH₂, Nal 2-NH₂, D-Nal 2-NH₂,

Tic-NH₂, D-Tic-NH₂, 1'-aminoindan, 1'-aminoindane-1-carboxyl-NH₂, Aic-NH₂, Atc-NH₂,

Disc-NH₂, Tpi-NH₂, D-Tpi-NH₂, Tiq-NH₂, D-Tiq-NH₂, tryptamide, NMe-tryptamide, alpha-

Me-tryptamide, 2'-(4"-methylphenyl)ethylamide, 3',4'- Cl_2)phenylmethanamide, 3'-

phenylpropylamide, 2',4'-dichlorobenzylamide, 3'-(1H-imidazol)propylamide, 4-phenyl-

piperidine-4-carbonamide, 3-phenyl-1-propylamide, 2,4-dichlorophenethylamide, S-(-)-1-

(2-naphthyl)ethylamide, S-(-)-1-(1-naphthyl)ethylamide, 2'-methylbenzylamide, 4'-

methylbenzylamide, 2',2'-diphenylethylamide, 1-(2-pyridyl)piperazine, N-benzylmethylamide, histamide, R-(+)-1-(2-Naphthyl)ethylamide, Trp-Asp-NH₂, Trp-Asp-Phe-NH₂, Asp-Trp-NH₂, Ala-Trp-NH₂, Trp-Ala-NH₂, phenethylamide or Trp-Asp-OH.

10. (original) The peptide of claim 9 consisting of the sequence:

7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Ala-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-Phe-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-NH₂,
 heptanoyl-Thr(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-MeTrp-NH₂,
 heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-MeTrp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-NMe-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-alpha-Me-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-S-(-)-1-(1-Naphthyl)ethylamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 1-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-D-Nal 2-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 2-NH₂,
 2'-naphthylacetyl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂,
 4'-phenylbutyryl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂,
 3',4'-dichlorophenyl-acetyl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂, or
 3'-CF₃phenyl-acetyl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂.

11. (Withdrawn-currently amended) A peptide, consisting of the sequence 7'-amino-heptanoyl – S₂ – D-Phe(4-Cl) – S₄ – S₅, wherein

S₂ is absent or is Ser(Bzl), Ala, D-Ala, beta-Ala, Val, Leu, Chg, Aib, Tle, 1-amino-

1cyclohexanecarbonyl, Inp, CO(CH₂)₂NH, CO(CH₂)₂CO, Pip, MeThr(Bzl), Thr(Bzl) or D-

Thr(Bzl);

S₄ is Arg, D-Arg, (Nlys)Gly, Trp, Lys, homoLys, Dpr(beta-Ala), alpha-(N-amidino-4'-piperidine)Gly, (4'-guanidino)Gly, (4'-guanidino)Phe, D-(4'-guanidino)Phe, beta-(N-amidino-4'-peperidine)Ala or homo-Ala-4'-pip(N-amidino); and

S₅ is Trp, Trp-OH, Trp-NH₂, ~~Trp-Cys-NH₂~~, D-Trp, D-Trp-NH₂, Trp-Val-NH₂, 3'-Pya-NH₂, Phe-NH₂, MeTrp-NH₂, beta-Ala-Trp-NH₂, aminobutylamide, Nal 1-NH₂, D-Nal 1-NH₂, Nal 2-NH₂, D-Nal 2-NH₂, Tic-NH₂, D-Tic-NH₂, 1'-aminoindan, 1'-aminoindane-1-carboxyl-NH₂, Aic-NH₂, Atc-NH₂, Disc-NH₂, Tpi-NH₂, D-Tpi-NH₂, Tiq-NH₂, D-Tiq-NH₂, tryptamide, NMe-tryptamide, alpha-Me-tryptamide, 2'-(4"-methylphenyl)ethylamide, 3',4'-Cl₂)phenylmethylamide, 3'-phenylpropylamide, 2',4'-dichlorobenzylamide, 3'-(1H-imidazol)propylamide, 4-phenyl-piperidine-4-carbonamide, 3-phenyl-1-propylamide, 2,4-dichlorophenethylamide, S-(-)-1-(2-naphthyl)ethylamide, S-(-)-1-(1-naphthyl)ethylamide, 2'-methylbenzylamide, 4'-methylbenzylamide, 2',2'-diphenylethylamide, 1-(2-pyridyl)piperazine, N-benzylmethylamide, histamide, R-(+)-1-(2-Naphthyl)ethylamide, Trp-Asp-NH₂, Trp-Asp-Phe-NH₂, Asp-Trp-NH₂, Ala-Trp-NH₂, Trp-Ala-NH₂, phenethylamide or Trp-Asp-OH.

12. (original) The peptide of claim 11 consisting of the sequence

7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Ala-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-Phe-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-MeTrp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-NMe-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-alpha-Me-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-S-(-)-1-(1-

Naphthyl)ethylamide,

7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 1-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-D-Nal 2-NH₂, or

7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 2-NH₂.

13. (previously presented) A peptide, consisting of the sequence S₁ – S₂ – S₃ – S₄ – S₅, wherein

S₁ is heptanoyl, 2'-naphthylacetyl, 7'-amino-heptanoyl, 2'-chlorophenylacetyl, 3'-chlorophenylacetyl, 4'-chlorophenylacetyl, 4'-phenylbutylaminocarbonyl, 3'-phenylbutylaminocarbonyl, 4'-bromophenyl-acetyl, 3,4-dichlorophenyl-acetyl, 2,4-dichlorophenyl-acetyl, 4-biphenyl-acetyl, 2-naphthoyl, Ph-(CH₂)₂NH, 3'-phenylpropanecarbonyl, 2'-naphthoyl-Pip, 2'-naphthylacetyl, 2'-bromophenyl-acetyl, 4'-CF₃phenyl-acetyl, 3'-CF₃phenyl-acetyl, 2'-CF₃phenyl-acetyl, 3',5'-CF₃phenylacetyl, 2',5'-CF₃phenylacetyl, 4'-Mephenyl-acetyl, 3'-Mephenyl-acetyl, 2'-Mephenyl-acetyl, 7'-aminoheptonoyl, beta-Ala, 4-aminoBytyl, 5-aminoValeryl, 6-aminoCaproyl, aminoTranexamyl, Cmpi or 3'4'-Cl₂phenylacetyl;

S₂ is absent or is Ser(Bzl), Ala, D-Ala, beta-Ala, Val, Leu, Chg, Aib, Tle, 1-amino-1cyclohexanecarbonyl, Inp, CO(CH₂)₂NH, CO(CH₂)₂CO, Pip, MeThr(Bzl), Thr(Bzl) or D-Thr(Bzl);

S₃ is Phe, D-Phe, Phe(4-Cl), D-Phe(4-Cl), Phe(3-Cl), D-Phe(3-Cl), Phe(2-Cl), D-Phe(2-Cl), D-Phe(3,4-diCl), MePhe, D-MePhe, D-Tic, D-Tpi, D-Nal 2, Arg, D-Phe(3,4-F₂), D-Tiq, D-Me(homo)Phe or D-EtPhe;

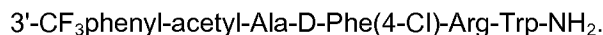
S₄ is Arg, D-Arg, (Nlys)Gly, Trp, Lys, homoLys, Dpr(beta-Ala), alpha-(N-amidino-4'-piperidine)Gly, (4'-guanidino)Gly, (4'-guanidino)Phe, D-(4'-guanidino)Phe, beta-(N-amidino-4'-piperidine)Ala or homo-Ala-4'-pip(N-amidino); and

S₅ is Trp, Trp-OH, Trp-NH₂, D-Trp, D-Trp-NH₂, Trp-Val-NH₂, 3'-Pya-NH₂, Phe-NH₂, MeTrp-NH₂, beta-Ala-Trp-NH₂, aminobutylamide, Nal 1-NH₂, D-Nal 1-NH₂, Nal 2-NH₂, D-Nal 2-NH₂, Tic-NH₂, D-Tic-NH₂, 1'-aminoindan, 1'-aminoindane-1-carboxyl-NH₂, Aic-NH₂, Atc-NH₂, Disc-NH₂, Tpi-NH₂, D-Tpi-NH₂, Tiq-NH₂, D-Tiq-NH₂, tryptamide, NMe-tryptamide, alpha-Me-tryptamide, 2'-(4"-methylphenyl)ethylamide, 3',4'-Cl₂)phenylmethanamide, 3'-phenylpropylamide, 2',4'-dichlorobenzylamide, 3'-(1H-imidazol)propylamide, 4-phenylpiperidine-4-carbonamide, 3-phenyl-1-propylamide, 2,4-dichlorophenethylamide, S-(-)-1-

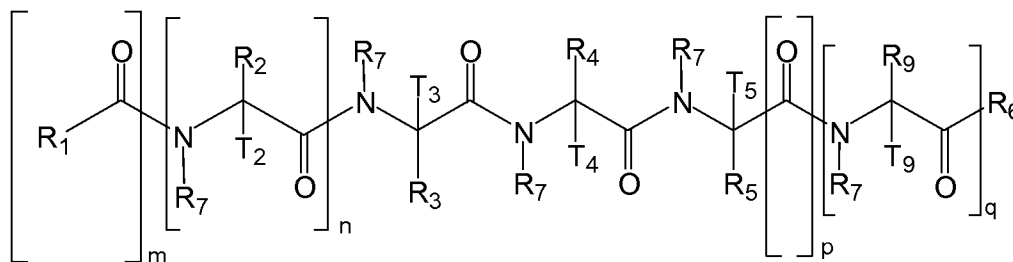
(2-naphthyl)ethylamide, S-(-)-1-(1-naphthyl)ethylamide, 2'-methylbenzylamide, 4'-methylbenzylamide, 2',2'-diphenylethylamide, 1-(2-pyridyl)piperazine, N-benzylmethylamide, histamide, R-(+)-1-(2-Naphthyl)ethylamide, Trp-Asp-NH₂, Trp-Asp-Phe-NH₂, Asp-Trp-NH₂, Ala-Trp-NH₂, Trp-Ala-NH₂, phenethylamide or Trp-Asp-OH.

14. (original) The peptide of claim 13 consisting of the sequence

7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Ala-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-Phe-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-Asp-NH₂,
 heptanoyl-Thr(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Nal 2-Arg-Trp-NH₂,
 7'-amino-heptanoyl-Ala-D-Nal 2-Arg-Trp-NH₂,
 Ser(Bzl)-D-Nal 2-Arg-Trp-NH₂,
 Ser(Bzl)-D-Nal 2-Arg-D-Trp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-MeTrp-NH₂,
 heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-MeTrp-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-NMe-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-alpha-Me-Tryptamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-S-(-)-1-(1-Naphthyl)ethylamide,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 1-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-D-Nal 2-NH₂,
 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Nal 2-NH₂,
 2'-naphthylacetyl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂,
 4'phenylbutyryl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂,
 3',4'-dichlorophenyl-acetyl-Ala-D-Phe(4-Cl)-Arg-Trp-NH₂, or



15. (Withdrawn-previously presented) A melanocortin receptor-specific linear peptide



of the formula:

where:

R₁ is an aliphatic L- or D-amino acid, N-acylated L- or D-aliphatic amino acid or R₈;

R₈ is independently selected from the group consisting of linear or branched C₁ to C₁₇ alkyl, aryl, heteroaryl, alkene, alkenyl, or aralkyl chains;

R₂ and R₃ are each independently H, CH₃, or an aromatic substituent aryl or heteroaryl side chain of a natural or synthetic L- or D-amino acid containing at least one aromatic ring moiety, wherein the ring(s) may additionally be functionalized by one or more halogen, alkyl or aryl groups;

R₄ is a positively charged aliphatic or aromatic side chain of a natural or synthetic L- or D-amino acid, wherein the chain comprises at least one nitrogen-containing group, or is a neutral aliphatic side chain having hydrogen donors and/or acceptors;

R₅ is H, CH₃, an aromatic substituent aryl or heteroaryl side chain of a natural or synthetic L- or D-amino acid containing at least one aromatic ring moiety wherein the ring(s) may additionally be functionalized by one or more halogen, alkyl or aryl groups, or a substituent alkyl or hydrogen bonding polar side chain of a natural or synthetic L- or D-amino acid wherein the side chain has a hydrogen donor or acceptor moiety;

R₆ is hydroxide, NH₂, or NH-R₈;

R₇ is H, methyl, ethyl, propyl, butyl, or a higher linear or branched chain terminating in an amino group, benzyl, or aralkyl group;

R₉ is H or an amino acid side chain group;

m is 1 or 0, with the proviso that if m is 0 then this functionality is not present and the N-terminal group is an amine;

n is 1 or 0, with the proviso that if n is 0 then this amino acid is not present;

p is 1 or 0, with the proviso that when p is 0 the chain terminates with the combination of R₅ and T₅ and there is no q and no R₆;

q is 1 or 0, with the proviso that when q is 0 and p is 1 then the terminal group is R₆; and

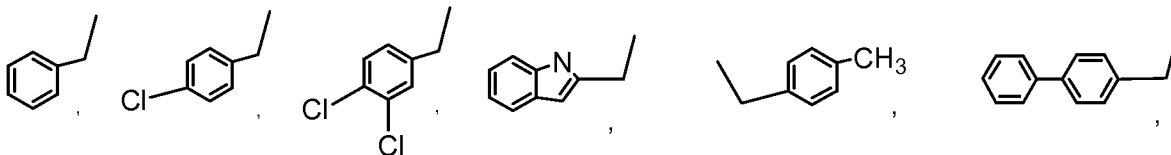
T₂, T₃, T₄, T₅, and T₉ are each H, CH₃, C₂H₅ or a benzyl group;

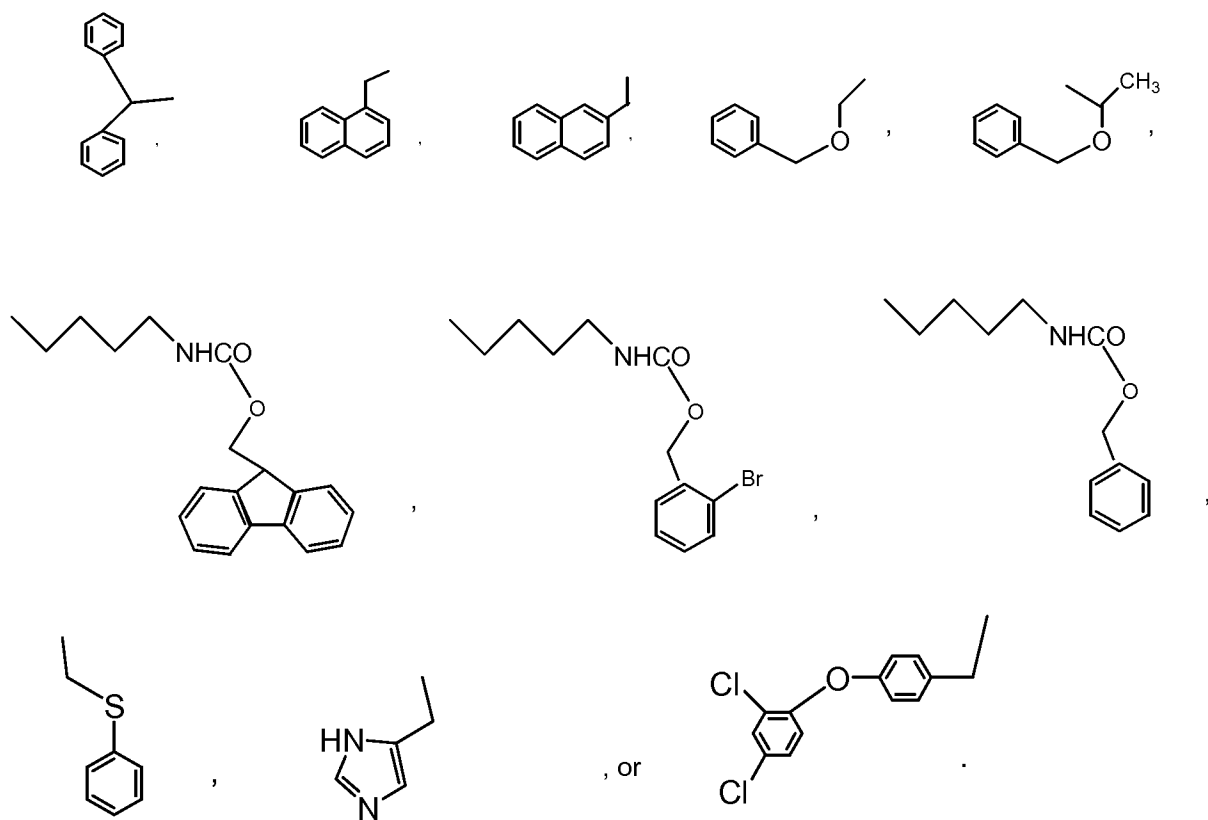
provided that one or more of the pairs R₂ and T₂, or R₃ and T₃, or R₄ and T₄, or R₅ and T₅, or R₉ and T₉ moieties may be joined together by additional carbon-carbon bonds to form a five-, six- or seven-membered ring structure; and

further provided that one or more of R₂, R₄, R₅ or R₉ may be joined to the R₇ group that immediately precedes such R₂, R₄, R₅ or R₉ group by additional carbon-carbon bonds to form a five-, six- or seven-membered ring structure, thereby fixing such R₂, R₄, R₅ or R₉ group to the immediately preceding nitrogen atom.

16. (Withdrawn) The linear peptide of claim 15 wherein R₈ is a C₁ to C₁₇ aliphatic linear chain or branched chain group, an acylated group derived from C₁ to C₁₇ aliphatic linear chain or branched chain group, an omega amino and carboxylic derivative of a C₁ to C₁₇ aliphatic linear chain or branched chain groups, or an omega amino derivative of an acylated group derived from a C₁ to C₁₇ aliphatic linear chain or branched chained group.

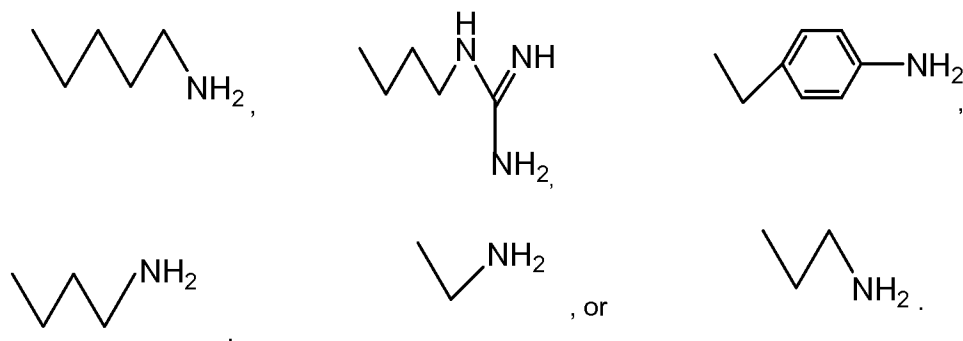
17. (Withdrawn) The linear peptide of claim 15 wherein at least one of R₂ and R₃ are



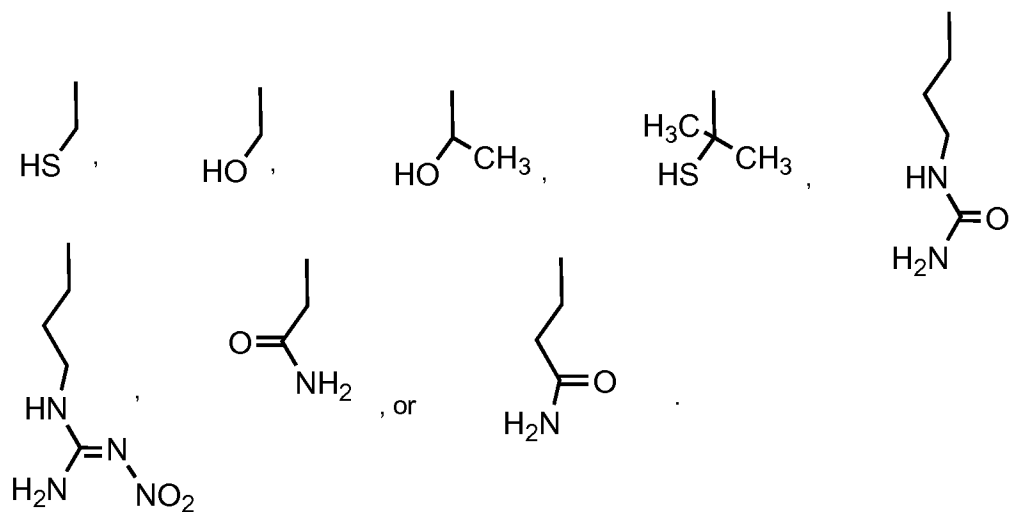


18. (Withdrawn) The peptide of claim 15 wherein R_4 is a positively charged aliphatic or aromatic side chain of a natural or synthetic L- or D-amino acid, wherein the at least one nitrogen-containing group in the chain is an amide, imide, amine or nitrile.

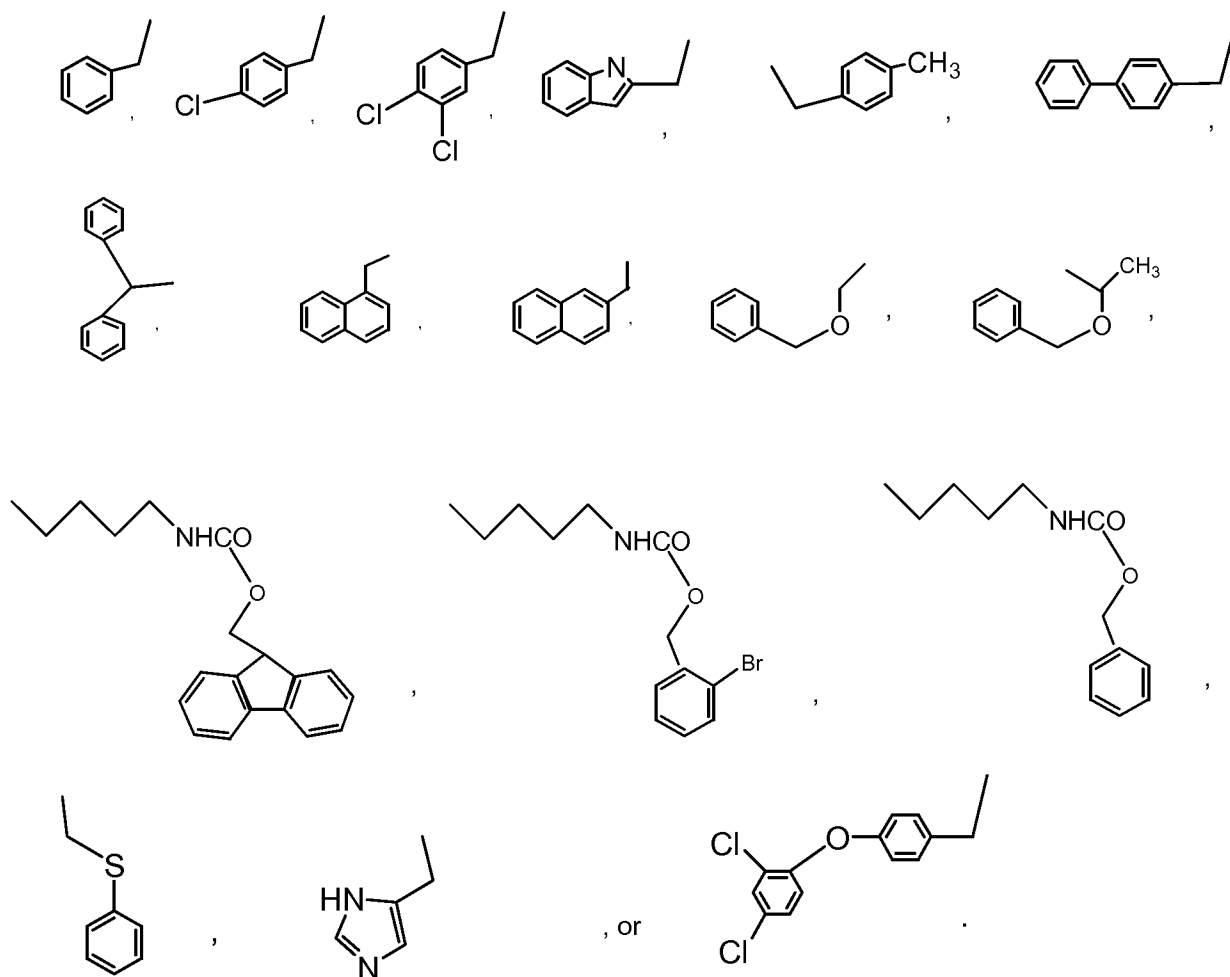
19. (Withdrawn) The peptide of claim 15 wherein R₄ is



20. (Withdrawn) The peptide of claim 15 wherein R₄ is a neutral aliphatic side chain having hydrogen donors and/or acceptors comprising:



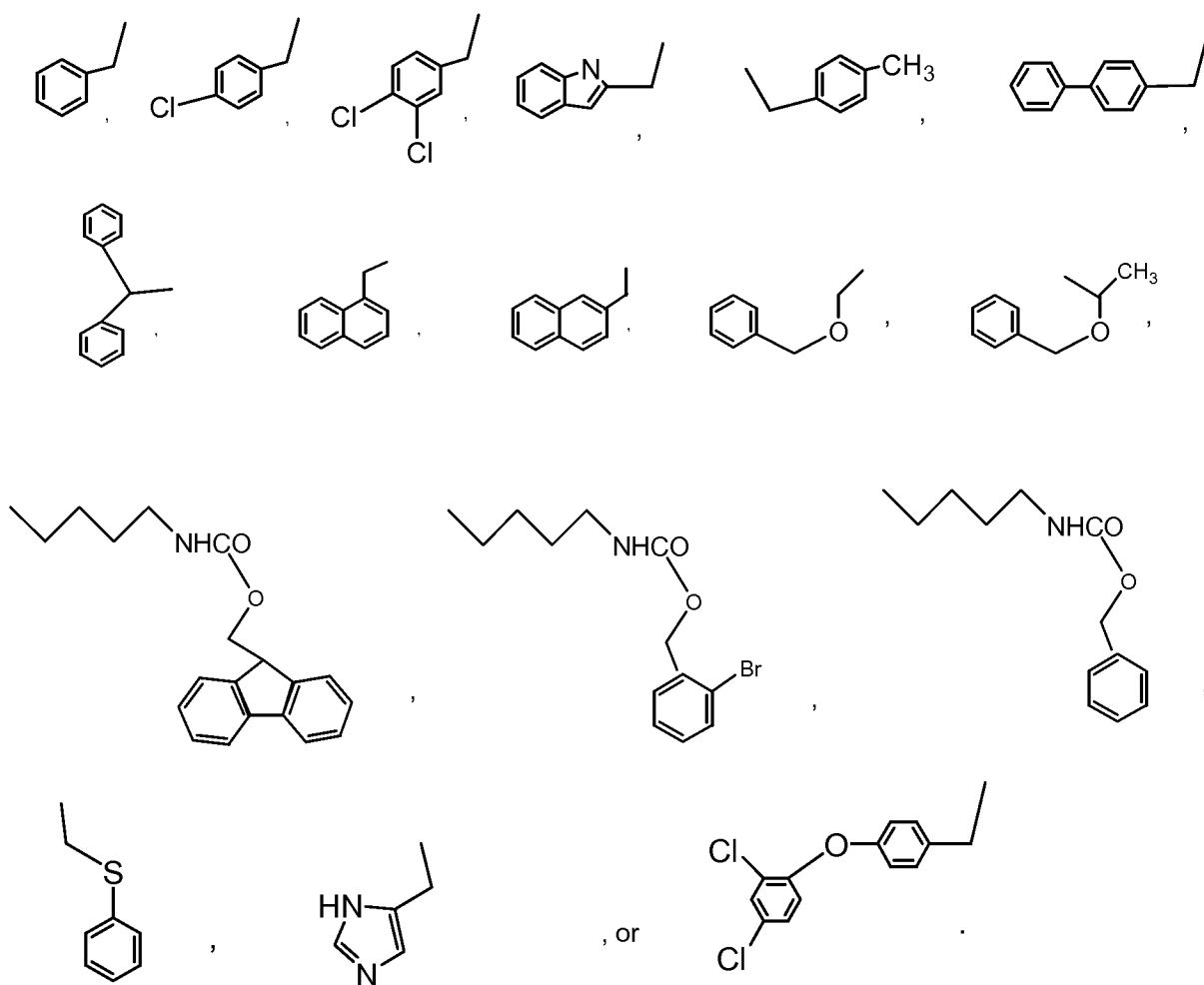
21. (Withdrawn) The peptide of claim 15 wherein R₅ is



22. (Withdrawn) The peptide of claim 15 wherein R₉ is methyl, ethyl, propyl, butyl, a higher linear or branched chain, or a linear chain terminating in an amino group, benzyl, or aralkyl group.

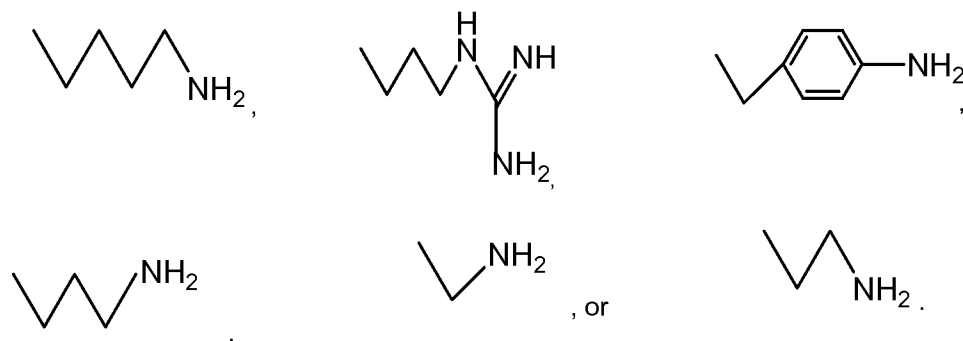
chain or branched chain group, an omega amino and carboxylic derivative of a C₁ to C₁₇ aliphatic linear chain or branched chain groups, or an omega amino derivative of an acylated group derived from a C₁ to C₁₇ aliphatic linear chain or branched chained group.

25. (Withdrawn) The cyclic peptide of claim 23 wherein at least one of R₂, R₃ or R₆ are independently

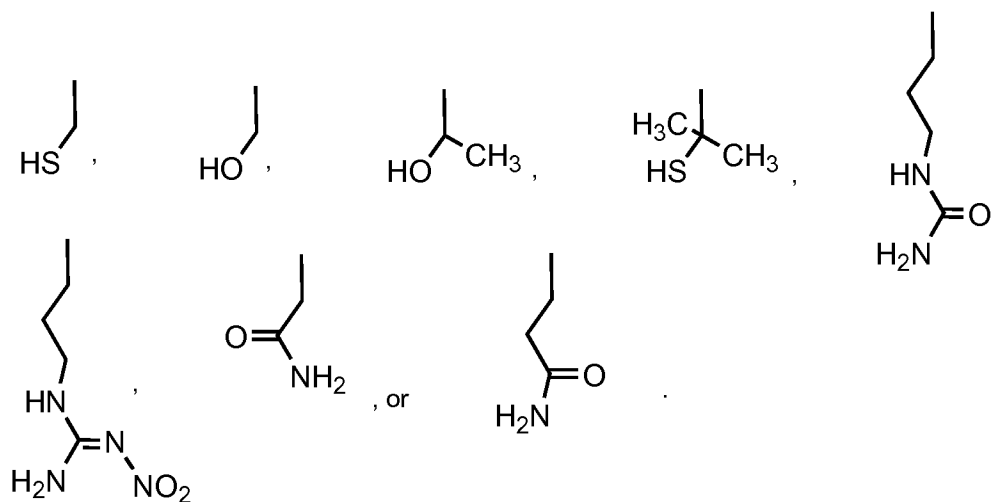


26. (Withdrawn) The cyclic peptide of claim 23 wherein R₄ is a positively charged aliphatic or aromatic side chain of a natural or synthetic L- or D-amino acid, wherein the at least one nitrogen-containing group in the chain is an amide, imide, amine or nitrile.

27. (Withdrawn) The cyclic peptide of claim 23 wherein R₄ is



28. (Withdrawn) The cyclic peptide of claim 23 wherein R₄ is a neutral aliphatic side chain having hydrogen donors and/or acceptors comprising:



29. (Withdrawn) A method of stimulating sexual response in a mammal, comprising administering a pharmaceutically sufficient amount of a melanocortin receptor 3 and/or 4 selective agonist peptide of any of the foregoing claims.

30. (Withdrawn) The method of claim 29 comprising a method of administration selected from the group consisting of intravenous, subcutaneous, intramuscular, parenteral,

intranasal, oral, dermal, inhalation, buccal, pulmonary, ocular, sublingual and vaginal administration.

31. (Withdrawn) A method of decreasing food intake in a mammal, comprising administering a pharmaceutically sufficient amount of a melanocortin receptor 4 and/or 5 selective agonist peptide of any of claims 1 to 28.

32. (Withdrawn) The method of claim 31 comprising a method of administration selected from the group consisting of intravenous, subcutaneous, intramuscular, parenteral, intranasal, oral, dermal, inhalation, buccal, pulmonary, ocular, sublingual and vaginal administration.

33. (Original) A peptide of the sequence 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂.

34. (Original) A pharmaceutical composition comprising a peptide of the sequence 7'-amino-heptanoyl-Ser(Bzl)-D-Phe(4-Cl)-Arg-Trp-NH₂.